

CLAIMS

- 1 1. A system for finding a target, comprising:  
2 a transponder disposed on the target;  
3 a transceiver for monitoring the location of the target;  
4 a wireless communication system configured to allow communication between  
5 said transponder and said transceiver, and  
6 a processor configured to find the target by virtual triangulation based on values  
7 of position information from said transponder and said transceiver.
- 1 2. The system for finding of claim 1, wherein said processor being configured to  
2 determine virtual triangulation based on successive values of said position information  
3 using at least three points  $P_1$ ,  $P_2$  and  $P_3$  of said transponder respective of said  
4 transceiver.
- 1 3. The system for finding of claim 1, wherein said processor being configured to  
2 determine virtual triangulation based on successive values of said position information  
3 of said transponder respective of said transceiver using a means for successive pattern  
4 movement technique configured to find the target, whereby said means for successive  
5 pattern movement obtains and corrects the direction to the location of the target T based  
6 on said values of said position information.
- 1 4. The system for finding of claim 1, wherein said processor being configured to  
2 determine virtual triangulation based on successive values of said position information  
3 relating to the average speed of the motion of the user of said transponder respective of  
4 said transceiver.

1 5. The system for finding of claim 1, wherein said processor being configured to  
2 determine virtual triangulation based on successive values of said position information  
3 relating to input of a user of said transceiver, whereby said user input signals motion  
4 between said transponder respective of said transceiver begins.

1 6. The system for finding of claim 1, wherein said processor being configured to  
2 determine virtual triangulation based on successive values of the elapsed time a  
3 ranging signal transmitted by said transceiver to said transponder, said transponder  
4 transmitting a reply ranging signal to said transceiver, whereby said transceiver  
5 transmitting said ranging signal and receiving said reply ranging signals from said  
6 transponder a predetermined number of times sufficient to determine an elapsed time.

1 7. The system for finding of claim 1, wherein said processor being configured to  
2 accumulate a phase shift between said ranging signal and said reply ranging signal.

1 8. The system for finding of claim 1, wherein said processor being configured with  
2 a phase shift detector.

1 9. The system for finding of claim 8, wherein said processor being configured to  
2 determine a value of an optimal operating resolution of said phase shift detector.

1 10. The system for finding of claim 8, wherein said phase shift detector is configured  
2 to measure a value of said phase shift between said ranging signal and said reply  
3 ranging signal.

1 11. The system for finding of claim 8, wherein said processor being configured to  
2 determine a value of said phase shift based on a value of a transmission interval.

1 12. The system for finding of claim 8, wherein said processor being configured to  
2 determine a value of said phase shift based on a value of a calibration interval.

1 13. The system for finding of claim 12, wherein said value of said calibration interval  
2 is periodically determined by each of said transponder and or said transceiver.

1 14. The system for finding of claim 8, wherein said processor determines said phase  
2 shift based on a value of an antenna propagation interval.

1 15. The system according to claim 1, wherein said transceiver is configured to enter a  
2 homing mode for searching for the target, said homing mode being entered when a  
3 value of said position information between said transceiver and the target corresponds  
4 to a predetermined value.

1 16. The system according to claim 15, wherein said homing mode toggled between  
2 states of on and off by a value of said position information of the target being equal to a  
3 predetermined value of a position ambiguity of the target.

1 17. The system according to claim 16, wherein said transceiver is configured to exit  
2 said homing mode after an elapsed predetermined time period.

1 18. The system according to claim 16, wherein said transceiver is configured to enter  
2 said homing mode to determine a location of the target when requested by input from a  
3 user.

1 19. The system according to claim 1, wherein said processor is configured to reduce  
2 position ambiguity of transceiver respective of the target based on generating a value  
3 for input information signals on at least one band.

1 20. The system according to claim 19, wherein said transceiver is configured to  
2 generate auditory signals representative of when said position ambiguity of the target is  
3 equal to a predetermined value for said position ambiguity.

- 1 21. The system according to claim 1, wherein said processor is configured to operate  
2 on a band using on a spread spectrum to establish position information signals from  
3 said transponder and said transceiver.
- 1 22. The system according to claim 1, wherein said transceiver being configured with  
2 an interface with the user so as to communicate to the user through said interface by  
3 one or more of the sensing group of audible, visual or physical.
- 1 23. The system according to claim 22, wherein said interface includes a display for  
2 visually displaying said position information to the user.
- 1 24. The system according to claim 23, wherein said display includes is LCD screen  
2 having means for indicating said position information to the user.
- 1 25. The system according to claim 22, wherein said interface includes indicator  
2 means configured to display said position information to the user on a predetermined  
3 pattern.
- 1 26. The system according to claim 2, wherein said values from said three points  $P_1$ ,  
2  $P_2$  and  $P_3$  create a point of intersection of circles based on circles with radii  $R_1$ ,  $R_2$  and  $R_3$   
3 originating from said points  $P_1$ ,  $P_2$  and  $P_3$ , respectively, whereby said point of  
4 intersection finds the target respective of said transceiver.
- 1 27. The system according to claim 1, wherein said transceiver is configured to adjust  
2 adaptively a power value of a transmitter of said transceiver so as to improve a value of  
3 said position information.

1 28. The system according to claim 1, wherein said transceiver is configured to adjust  
2 adaptively a sensitivity value of a receiver of said transceiver so as to improve a value  
3 of said position information.

1 29. The system according to claim 1, wherein said transponder is configured to  
2 adjust adaptively a power value of a transmitter of said transponder so as to improve a  
3 value of said position information.

1 30. The system according to claim 1, wherein said transponder is configured to  
2 adjust adaptively a sensitivity value of a receiver of said transponder so as to improve a  
3 value of said position information.

1 31. The system according to claim 1, wherein said processor being configured to be  
2 in communication with an antenna, said processor being configured to repeatedly  
3 determine values for said position information based on one or more of the following  
4 values for:

5 a transmission interval between said transceiver and said transponder, said  
6 transmission interval being an elapsed time between transmitting said ranging signal  
7 and receiving said reply ranging signal,

8 a calibration interval between each of said transceiver and transponder said  
9 calibration interval being a time interval of a period to normalize the circuitry of said  
10 transponder and said transceiver, and

11 an antenna propagation interval of either of said transceiver or said transponder,  
12 or both, said antenna propagation interval being an elapsed time of a signal measured  
13 as it passes through said antenna of said transponder or said transceiver.

1 32. The system according to claim 1, wherein said processor is configured for  
2 communication with an antenna to repeatedly determine values for said position  
3 information based on a value for a measured distance between said transponder and  
4 said transceiver.

1 33. The system according to claim 1, wherein said transceiver is configured for  
2 transmitting a ranging signal to said transponder, said transponder is configured for  
3 responding to said ranging signal by transmitting a reply ranging signal to said  
4 transceiver, and said processor is configured to determine a value of a measured  
5 distance between said transponder and said transceiver based on position information  
6 from said ranging signal and said reply ranging signal.

1 34. A method, comprises the steps of:

2 determining a value of a point  $P_1$  from position information received by a  
3 transceiver corresponding to a location of a transponder disposed on a target;

4 prompting said user to move said transceiver to a point  $P_2$  relative to a location of  
5 the target;

6 determining a value of a point  $P_2$  from position information received by said  
7 transceiver corresponding to a location of said transponder;

8 prompting said user to move said transceiver to a point  $P_3$  relative to a location of  
9 the target;

10 determining a value of a point  $P_3$  from position information received by said  
11 transceiver corresponding to a location of said transponder; and

12 finding the location of the target by virtual triangulation in accordance with each  
13 of said values for said points  $P_1$ ,  $P_2$  and  $P_3$  of position information received by said  
14 transceiver.

1 35. The method of claim 34 wherein said step of determining said position  
2 information further comprises repeating as necessary the steps of:

3 prompting a user to move said transceiver to a point  $P_n$  relative to a location of  
4 said target having said transponder;

5 determining a value of a point  $P_n$  from position information received by said  
6 transceiver corresponding to a location of said transponder; and

7 finding the location of the target from position information received by said  
8 transceiver by repeating said determining by virtual triangulation for two of each of  
9 said values for said points  $P_1$ ,  $P_2$  or  $P_3$  and said point  $P_n$ .

1 36. The method of claim 34 wherein said step of determining said position  
2 information further comprises the steps of:

3 determining said values of said position information of said target by:

4 determining a transmission interval between said transceiver and said  
5 transponder;

6 determining a calibration interval between each of said transceiver and  
7 transponder; and

8 determining an antenna propagation interval of each of said transceiver and  
9 transponder.

1 37. The method of claim 36 wherein said step of determining said position  
2 information further comprises the steps of:

3 determining said transmission interval based on an elapsed time between  
4 transmitting said ranging signal and receiving said reply ranging signal.

1 38. The method of claim 36 wherein said step of determining said position  
2 information further comprises the steps of:

3 determining said calibration interval based on a time interval of a period to  
4 normalize the circuitry of said transceiver and said transponder.

1 39. The method of claim 36 wherein said step of determining said position  
2 information further comprises the steps of:

3 determining said antenna propagation interval based on an elapsed time of a  
4 signal measured passing through said antenna of said transceiver and said transponder.

1 40. The method of claim 36 wherein said step of determining said position  
2 information further comprises the steps of:

3 generating a measured distance between each of said transceiver and said  
4 transponder.



1 41. The method of claim 40 wherein said step of determining determining said  
2 measured distance further comprises the steps of:

3 determining said position information of the target generated by a virtual  
4 triangulation relationship when successive values of said position information have a  
5 predetermined logical relationship relative to said previous values between said  
6 transceiver and said transponder.

1 42. The method of claim 36 wherein said step of determining said position  
2 information further comprises the steps of:

3 generating a measured distance between each of said transceiver and said  
4 transponder.

1 43. A computer-readable medium having stored thereon a plurality of sequences of  
2 instructions, said plurality of sequences of instructions including sequences of  
3 instructions which, when executed by a processor, cause said processor to perform the  
4 steps of:

5 determining a value of a point  $P_1$  from position information received by a  
6 transceiver corresponding to a location of a transponder disposed on a target;

7 prompting said user to move said transceiver to a point  $P_2$  relative to a location of  
8 the target;

9 determining a value of a point  $P_2$  from position information received by said  
10 transceiver corresponding to a location of said transponder;

11 prompting said user to move said transceiver to a point  $P_3$  relative to a location of  
12 the target;

13 determining a value of a point  $P_3$  from position information received by said  
14 transceiver corresponding to a location of said transponder; and

15 finding the location of the target in accordance with each of said values for said  
16 points  $P_1$ ,  $P_2$  and  $P_3$  of position information received by said transceiver.

1 44. A computer-readable medium having stored thereon a plurality of sequences of  
2 instructions, said plurality of sequences of instructions including sequences of  
3 instructions which, when executed by a processor, cause said processor to perform the  
4 steps of:

5 determining successive values of position information of a transceiver respective  
6 of a transponder disposed on a target;

7 finding using virtual triangulation the location of the target T based on said  
8 values of said position information, and

9 correcting position ambiguity of the location of the target based on said values of  
10 said position information.

1 45. A computer-readable medium having stored thereon a plurality of sequences of  
2 instructions, said plurality of sequences of instructions including sequences of  
3 instructions which, when executed by a processor, cause said processor to perform the  
4 steps of:

5 determining successive values of position information of a transceiver respective  
6 of a transponder disposed on a target; and

7 finding using virtual triangulation the location of the target T based on said  
8 values of said position information based on successive values of said position  
9 information relating to the average speed of the motion of the user of said transponder  
10 respective of said transceiver.

1 46. A computer-readable medium having stored thereon a plurality of sequences of  
2 instructions, said plurality of sequences of instructions including sequences of  
3 instructions which, when executed by a processor, cause said processor to perform the  
4 steps of:

5 determining successive values of position information of a transceiver respective  
6 of a transponder disposed on a target;

7 finding using virtual triangulation the location of the target T based on  
8 successive values of said position information relating to input of a user of said  
9 transceiver, whereby said user input signals motion between said transponder  
10 respective of said transceiver begins.

1    47.    A portable device for tracking a target, comprising:  
2            processor for determining position information of the target,  
3            memory operably connected to said processor, wherein said memory being  
4    configured to store a plurality of sequences of instructions, said plurality of sequences  
5    of instructions including sequences of instructions which, when executed by said  
6    processor, cause said processor to perform the steps of:  
7            determining a value of a point  $P_1$  from position information received by a  
8    transceiver corresponding to a location of a transponder disposed on a target;  
9            prompting said user to move said transceiver to a point  $P_2$  relative to a location of  
10   the target;  
11           determining a value of a point  $P_2$  from position information received by said  
12   transceiver corresponding to a location of said transponder;  
13           prompting said user to move said transceiver to a point  $P_3$  relative to a location of  
14   the target;  
15           determining a value of a point  $P_3$  from position information received by said  
16   transceiver corresponding to a location of said transponder; and  
17           finding the location of the target by virtual triangulation in accordance with each  
18   of said values for said points  $P_1$ ,  $P_2$  and  $P_3$  of position information received by said  
19   transceiver.

1 48. The portable device of claim 47 wherein said processor further repeating as  
2 necessary the steps of:

3 prompting a user to move said transceiver to a point  $P_n$  relative to a location of  
4 said target having said transponder;

5 determining a value of a point  $P_n$  from position information received by said  
6 transceiver corresponding to a location of said transponder; and

7 finding the location of the target from position information received by said  
8 transceiver by repeating said determining by virtual triangulation for two of each of  
9 said values for said points  $P_1$ ,  $P_2$  or  $P_3$  and said point  $P_n$ .

1 49. The portable device of claim 47 wherein said processor further executing the  
2 steps of:

3 determining said values of said position information of said target by:

4 determining a transmission interval between said transceiver and said  
5 transponder;

6 determining a calibration interval between each of said transceiver and  
7 transponder; and

8 determining an antenna propagation interval of each of said transceiver and  
9 transponder.

1 50. The portable device of claim 49 wherein said processor further executing the  
2 steps of:

3 determining said transmission interval based on an elapsed time between  
4 transmitting said ranging signal and receiving said reply ranging signal.

1 51. The portable device of claim 49 wherein said processor further executing the  
2 steps of:

3 determining said calibration interval based on a time interval of a period to  
4 normalize the circuitry of said transceiver and said transponder.

1 52. The portable device of claim 49 wherein said processor further executing the  
2 steps of:

3 determining said antenna propagation interval based on an elapsed time of a  
4 signal measured passing through said antenna of said transceiver and said transponder.

1 53. The portable device of claim 49 wherein said processor further executing the  
2 steps of:

3 generating a measured distance between each of said transceiver and said  
4 transponder.

1 54. The portable device of claim 53 wherein said processor further executing the  
2 steps of:

3 determining said position information of the target generated by a virtual  
4 triangulation relationship when successive values of said position information have a  
5 predetermined logical relationship relative to said previous values between said  
6 transceiver and said transponder.

1 55. A mobile system for tracking a target T, comprising:  
2 a unit disposed on the target T;  
3 a monitoring unit for monitoring the location of the target T;  
4 a wireless communication system operating on at least one Radio Frequency (RF)  
5 band, said wireless communication system being configured to allow communication  
6 between configured to allow communication between at least two monitoring units and  
7 the target T, and  
8 a processor configured to find the target T by virtual triangulation based on  
9 values of position information from said monitoring unit and said unit disposed on the  
10 target. T.

1 56. The mobile system according to claim 55, wherein said processor being  
2 configured to be in communication with an antenna, said processor being configured to  
3 repeatedly determine values for said position information from:  
4 a transmission interval between said monitoring unit and the target T,  
5 a calibration interval between each of said monitoring unit and the target T, and  
6 an antenna propagation interval of said monitoring unit and the target T.

1 57. The mobile system according to claim 56, wherein further comprising :  
2 means for generating values of a measured distance between units, said  
3 generating means determining said values of said measured distance between said  
4 monitoring unit and the target T based on a virtual triangulation relationship using said  
5 position information.

1 58. The mobile system according to claim 57, wherein said processor being  
2 configured to be in communication with an antenna, said processor being configured to  
3 repeatedly determine values for said position information from:

4 a transmission interval between said monitoring unit and the target T,  
5 a calibration interval between each of said monitoring unit and the target T, and  
6 an antenna propagation interval of said monitoring unit and the target T.

1 59. The mobile system according to claim 56, wherein said transmission interval  
2 being an elapsed time between transmitting said ranging signal and receiving said reply  
3 ranging signal.

1 60. The mobile system according to claim 56, wherein said calibration interval being  
2 a time interval of a period to normalize the circuitry of said monitoring unit and the  
3 target T.

1 61. The mobile system according to claim 56, wherein said antenna propagation  
2 interval being an elapsed time of a signal measured as it passes through said antenna of  
3 said monitoring unit and the target T.

1 62. The mobile system according to claim 56, wherein said system being configured  
2 to generate said virtual triangulation from said position information from a plurality of  
3 monitoring units or units disposed on the target T.



1 63. The mobile system according to claim 56, further comprising a plurality of  
2 monitoring units being configured to generate said virtual triangulation from said  
3 position information based on values received from said monitoring unit, or said units  
4 disposed on the target T, or units adjacent the target T.

1 64. The mobile system according to claim 63, whereby said monitoring unit or said  
2 units disposed on the target T or units adjacent the target T, are linked dynamically so  
3 as to form a mobile network adapted to locate, track and determine the position of each  
4 of said plurality of units.

1 65. The mobile system according to claim 64, wherein said mobile network being  
2 configured to enable a coordinated search to intercept the target T.

1 66. The mobile system according to claim 65, wherein said monitoring unit of said  
2 mobile network configured having an indicator means adapted to illustrate to each of  
3 said monitoring units in a predetermined range, said indicator means configured to  
4 instruct respective monitoring units to move coordinately so as to converge on said  
5 target T based on said position information determined by said virtual triangulation  
6 relationship.

1 67. The mobile system according to claim 56, wherein said position information  
2 determines values for three points  $P_1$ ,  $P_2$  and  $P_3$  so as to create a point of intersection of  
3 circles with radii  $R_1$ ,  $R_2$  and  $R_3$  originating from said points  $P_1$ ,  $P_2$  and  $P_3$ , respectively,  
4 whereby said point of intersection finds the target respective of each of said monitoring  
5 units.

1 68. The mobile system according to claim 56, wherein said processor being  
2 configured to determine virtual triangulation based on successive values of said  
3 position information using at least three points  $P_1$ ,  $P_2$  and  $P_3$  of said monitoring unit  
4 respective of said unit disposed on the target T.

1 69. The mobile system according to claim 56, wherein said processor being  
2 configured to determine virtual triangulation based on successive values of said  
3 position information of said transponder respective of said transceiver using a means  
4 for position ambiguity reduction (PAR) configured to find the target, whereby said PAR  
5 means obtains and corrects the direction to the location of the target T based on said  
6 values of said position information.

1 70. The mobile system according to claim 56, wherein said processor being  
2 configured to determine virtual triangulation based on successive values of said  
3 position information relating to the average speed of the motion of the user of said unit  
4 slave unit respective of said master unit.

1 71. The mobile system according to claim 56, wherein said processor being  
2 configured to determine virtual triangulation based on successive values of said  
3 position information relating to input of a user of said transceiver, whereby said user  
4 input signals motion based on slave unit respective of said master unit begins.

1 72. The mobile system according to claim 56, wherein said processor is configured to  
2 operate on a band using on a spread spectrum to establish position information signals  
3 from said slave unit respective of said master unit.

1       73.    A computer-readable medium having stored thereon a plurality of sequences  
2            of instructions, said plurality of sequences of instructions including sequences  
3            of instructions which, when executed by a processor, cause said processor to  
4            perform the steps of:

5            determining a value of a point  $P_1$  from position information received by a  
6            transceiver corresponding to a location of a transponder disposed on a target;

7            prompting said user of a predetermined transceiver to move said predetermined  
8            transceiver to a point  $P_2$  relative to a location of the target;

9            determining a value of a point  $P_2$  from position information of said  
10           predetermined transceiver corresponding to a location of said transponder;

11           requesting said value of said point  $P_2$  of said predetermined transceiver;

12           requesting a value of a point  $P_3$  corresponding to a location of said  
13           predetermined transceiver; and

14           finding the location of the target in accordance with each of said values for said  
15           points  $P_1$ ,  $P_2$  and  $P_3$ .

1       74.    A system for finding a target, comprising:

2            a tracked unit, said tracked unit being configured with a transponder and is  
3            disposed on the target;

4            a monitoring unit, said monitoring unit being configured with a transceiver, said  
5            monitoring unit configured for monitoring and tracking the location of the target;

6            a communication system configured to communicate between said transponder  
7            and said transceiver on radio frequency band, and

8            whereby said monitoring device has means for generating a measured distance  
9            between said monitoring device and said tracked unit, said monitoring device has  
10           means for determining the monitoring and tracking of the location of the target by a  
11           virtual triangulation relationship without need for additional points of references.

1           75.    The system for finding the target of claim 74, wherein said monitoring  
2 unit moves in a virtual triangulation pattern where successive movements of said  
3 monitoring unit are based on logical, algorithmic and mathematical relationships  
4 between said measured distance values between said monitoring unit and said tracked  
5 unit.

1           76.    The system for finding the target of claim 74, wherein said monitoring  
2 unit includes means for generating a measured distance between locations of successive  
3 movements of said monitoring unit or between successive locations of said monitoring  
4 unit as input by the user.

1           77.    The system for finding the target of claim 76, wherein said monitoring  
2 unit moves in a virtual triangulation pattern where successive movements of said  
3 monitoring unit are based on logical, algorithmic and mathematical relationships  
4 between said measured distance values between said monitoring unit and said tracked  
5 unit, and said distance values between said monitoring unit successive locations.

1           78.    The system for finding the target of claim 77, wherein said monitoring  
2 unit generates visual and audio information prompts for said monitoring unit  
3 successive movement.

1           79.    The system for finding the target of claim 78, wherein said monitoring  
2 unit generates visual and audio information that conveys said monitoring unit  
3 successive movements and said target movements, and said monitoring unit and said  
4 target relative location as well the bearing angle to the target.

1           80.    The system for finding the target of claim 79, wherein said monitoring or  
2 tracked units are configured with GPS, compass or other position and/or direction  
3 determining devices.

1           81.    The system for finding the target of claim 80, wherein said monitoring  
2 unit generates visual and audio information that conveys said monitoring unit and the  
3 target successive movements, relative location and or absolute location.

1           82.    The system for finding the target of claim 80, wherein said monitoring  
2 unit generates visual and audio information that conveys said monitoring unit and the  
3 target successive movements, relative location and or absolute location.

1           83.    The system for finding the target of claim 74, wherein any three said  
2 monitoring units are stationary and are not located on the same straight line.

1           84.    The system for finding the target of claim 83, wherein said three  
2 stationary monitoring units can form a virtual system of coordinates in which the  
3 coordinates of the said three stationary monitoring units and the coordinates can be  
4 determined of all of the mobile monitoring units and targets that are within the  
5 communication range of said three stationary monitoring units.

1           85.    The system for finding the target of claim 84, wherein said mobile  
2 monitoring unit generates visual and audio information prompts for said monitoring  
3 unit successive movement.

1           86.    The system for finding the target of claim 85, wherein said mobile  
2 monitoring unit generates visual and audio information that conveys said virtual scaled  
3 coordinates together with said mobile monitoring unit and the target relative location,  
4 and successive movements of said mobile monitoring unit and said target, and said  
5 bearing angle from said mobile monitoring unit to the target, and said stationary  
6 monitoring units relative location.

1           87.    The system for finding the target of claim 86, wherein the data processing  
2 is performed by any said monitoring unit, stationary or mobile, or in a distributed  
3 fashion.

1           88.    The system for finding the target of claim 87, wherein said monitoring and  
2 tracked units are combined with GPS, compass or other position and/or direction  
3 determining devices.

1           89.    The system for finding the target of claim 88, wherein each mobile or  
2 stationary monitoring unit is equipped with a compass.

1           90.    The system for finding the target of claim 74 whereby an ambiguity zone  
2 is decreased by increasing a distance between each of points  $P_1$ ,  $P_2$  and  $P_3$ , said distance  
3 is increased between two of said points  $P_1$ ,  $P_2$  or  $P_3$  from an approximate value of  $1.75 \cdot E$   
4 to  $4 \cdot E$  to reduce said ambiguity zone formed between each of said tracked units,  
5 whereby  $E$  is a maximum error in said distance measured between two of said points  
6  $P_1$ ,  $P_2$  or  $P_3$ , a width of said ambiguity zone is equal to  $E$ , and a length of said ambiguity  
7 zone is less than  $2 \cdot E$ .

1           91.    The system for finding the target of claim 74, whereby an ambiguity zone  
2 is reduced by increasing a distance between each of points  $P_1$ ,  $P_2$  and  $P_3$ , said distance is  
3 increased between two of said points  $P_1$ ,  $P_2$  or  $P_3$  from an approximate value of  $1.9 \cdot E$  to  
4  $5 \cdot E$  to reduce an ambiguity zone formed between each of said tracked units, whereby  $E$   
5 is a maximum error said distance measured between two of said points  $P_1$ ,  $P_2$  or  $P_3$ , a  
6 width of said ambiguity zone is equal to  $E$ , and a length of said ambiguity zone is less  
7 than  $2 \cdot E$ .

1           92.    The system for finding the target of claim 91, whereby said system  
2 increases said distance measured between two of said points  $P_1$ ,  $P_2$  or  $P_3$  to a large  
3 distance reduces said ambiguity zone to a square having sides equal to  $E$ .

1           93.    The system for finding the target of claim 74, whereby said monitoring  
2 unit is configured with a loop back mode, said loop back mode utilizes a value  
3 representing a data processing time correction, said value for data processing time  
4 correction is determined by sending an output signal to the input of a receiver from an  
5 output of the transmitter of said monitoring unit, whereby said processor of said  
6 monitoring unit sends test data to the input of an encoder and starts a timer, said  
7 processor receives said output signal from said input of said receiver and stops said  
8 timer, said processor compares said test data and said received signal for a validation,  
9 said processor computing a loop back elapsed time from said timer, and said processor  
10 further corrects said loop back elapsed time by adding either of said validation or said  
11 data processing time correction, or both.

1           94.    The system for finding the target of claim 74, whereby said monitoring  
2 unit is configured with a loop back mode, said loop back mode utilizes an output signal  
3 sent from an output of a transmitter sent to an attenuator connected directly to the  
4 input of a receiver of said monitoring unit.

1           95.    The system for finding the target of claim 74, wherein said monitoring  
2 unit includes an interface for audio communications and telemetry information  
3 exchange so as to communicate between each of master units in the system  
4 simultaneously or independently from the operation of a processor regarding said  
5 distance measurement.

1           96.    The system for finding the target of claim 74, wherein an interface  
2 provides communications between said monitoring unit and said tracked unit in the  
3 system simultaneously or independently from the distance measurement operation.

1           97.    The system for finding the target of claim 96, whereby said interface  
2 provides full duplex audio communications and telemetry information exchange  
3 between said monitoring unit and said tracked unit, or between a plurality of said  
4 monitoring units in the system.

1           98.    An integrated circuit for a wireless system for locating and tracking a  
2 subject or object, comprising  
3           a receiver;  
4           a transmitter;  
5           a microprocessor having a common clock as a source of synchronization;  
6           whereby said receiver and transmitter together define an active transponder and  
7 the integrated circuit is preferably a monolithic single die integrated circuit including  
8 said receiver, said transmitter, and said microprocessor;  
9           said transponder supplies predetermined ranging signals to a data processor  
10 portion of said microprocessor, said transponder includes an encoder for encoding data  
11 for transmission by said transmitter, and said a receiver includes a decoder circuit for  
12 receiving and decoding signals received from said antennae, and said a data processor  
13 for determining interval and position information, said data processor comprising a  
14 digital signal processor (DSP), a voltage stabilizer, and a battery supervisor; and  
15           an antenna for propagating said ranging said signal.

1           99.    The circuit of claim 98, wherein said data information and ranging signals  
2 determined from input signals are coupled through a band pass filter, a distance  
3 measurement unit, and said decoder.



1           100. The circuit of claim 99, further including a microphone coupled to an  
2 input of a summing amplifier through a low frequency amplifier, said low frequency  
3 amplifier having compression/pre-emphasis, a low pass filter and an analog switch,  
4 said analog switch is operated by said DSP to enable a user to send voice  
5 communications when a monitoring or master unit is operating in a voice mode.

1           101. A method of a dynamic, mobile network for tracking and locating a  
2 plurality of monitoring units and targets T, comprising:  
3           tracking a primary target T with a primary monitoring unit having a  
4 predetermined range;  
5           determining when said target T moves out of said predetermined range;  
6           sending a ranging signal to at least one secondary monitoring unit within said  
7 predetermined range;  
8           receiving a reply ranging signal from at least one of said secondary monitoring  
9 unit;  
10          sending a request for a list of identified targets T to said secondary monitoring  
11 unit within a range of said secondary monitoring unit;  
12          receiving said list of identified targets T from said secondary monitoring unit;  
13          comparing said list of identified targets T to said primary target T;  
14          matching said primary target to one of said list of identified targets T from said  
15 secondary monitoring unit; and  
16          determining the location of the primary target from position information  
17 provided by said secondary monitoring unit.

1           102. A method of a dynamic, mobile network as in claim 101, comprising the  
2 additional step of: transferring tracking of said primary target to said secondary  
3 monitoring unit having said primary target in range.

1        103. A method for finding a target, comprising the steps of:  
2            determining a point  $P_1$  by having a user make an input to a monitoring unit;  
3            transmitting a ranging signal from said monitoring unit;  
4            receiving a reply ranging signal from a slave unit located on a subject or on an  
5        object at a point T, where said point T is located out of a range of said master unit;  
6            entering a homing mode on said monitoring unit;  
7            prompting said user to select a direction and having said user move in said  
8        direction along a path "Delta (1)" in a direction towards a point  $P_2$ ;  
9            actuating a step button on said monitoring unit to input once for each step taken  
10        by said user to generate reference points for a virtual triangulation calculation;  
11            prompting said user through said master unit to stop data input of said step  
12        button when said user reaches said point  $P_2$   
13            determining using a processor of said monitoring unit whether the distance between  
14        subsequent points Delta (n) is equal or greater than  $(4 - 5) * E$  such that a value of said  
15        path Delta (1) is sufficiently large to minimize the a position ambiguity of said target  
16        T.

1        104. The method for finding a target of claim 103, rther comprising the step of:  
2        prompting said user after reaching point  $P_1$  randomly to go either right or left from said  
3        Point  $P_1$  to a point  $P_2$  in a direction away from said target T.

1        105. The method for finding a target of claim 104, further comprising the step  
2        of: actuating a step button on said monitoring unit to input once for each step taken by  
3        said user going to point  $P_2$  in a direction away from said target T to generate reference  
4        points for a virtual triangulation calculation.

1        106. The method for finding a target of claim 105, further comprising the step  
2        of: prompting said user after reaching point  $P_2$  randomly to go either right or left from  
3        said Point  $P_2$  along a path "Delta (2)" to a point  $P_3$  in a direction away from said target T.

1           107. The method for finding a target of claim 106, , further comprising the step  
2 of: actuating a step button on said monitoring unit to input once for each step taken by  
3 said user going to point  $P_3$  in a direction away from said target T to generate reference  
4 points for a virtual triangulation determination.

1           108. The method for finding a target of claim 107, further comprising the step  
2 of: determining a Delta (n) using a current reference unit pre-programmed in said  
3 processor and calculating said Delta (n), which is equal to the difference ( $P(n-1)$  -  
4 current position).

1           109. The method for finding a target of claim 108, further comprising the step  
2 of: prompting said user after determining said Delta (n) to move in a direction toward  
3 the target T.

1           110. The method for finding a target of claim 109, further comprising the step  
2 of: prompting said user repeatedly along successive points  $P_{(n)}$  in a direction toward the  
3 target T using virtual triangulation, and  
4 entering a homing mode upon approaching said target T after determining said  
5 Delta (n) to move in a direction toward the target T, wherein said master unit  
6 prompts said user.

1           111. The method for finding a target of claim 110, further comprising the step  
2 of: requesting said slave unit to generate an audible signal upon approaching said  
3 target point T in said homing mode within a predetermined range, and generating an  
4 audible signal using said slave unit.

1 <sup>12</sup> 108. The method for finding a target of claim 111, further comprising the step of:  
2 requesting said slave unit to generate an audible signal upon approaching said  
3 target point T in said homing mode within a predetermined range, and  
4 generating an audible signal using said slave unit.

1 <sup>13</sup> 109. A method for finding a target, comprising the steps of:  
2 <sup>13</sup> determining a point P<sub>1</sub> by having a user make an input to a monitoring unit;  
3 transmitting a ranging signal from said monitoring unit;  
4 receiving a reply ranging signal from at least three stationary slave units located  
5 on subjects or on objects at a points T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> within a predetermined range of said  
6 monitoring unit, whereby each of said points T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> form a set of virtual  
7 coordinates relative to said point P<sub>1</sub>; and  
8 determining a location of said monitoring unit relative to said slave units using  
9 triangulation of points T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> and said virtual coordinates relative to said point  
10 P<sub>1</sub>.

11 <sup>14</sup>  
1 110. The method for finding a target of claim 109, further comprising the step of:  
2 transmitting a ranging signal from said monitoring unit to said slave units;  
3 receiving a reply ranging signal from each of said slave units; and  
4 prompting said user when said slave is out of a range of said monitoring unit.  
5

15  
1 111. The method for finding a target of claim 110, further comprising the step of:  
2 entering a homing mode on said monitoring unit;  
3 prompting said user to select a direction and having said user move in said  
4 direction along a path "Delta (1)" in a direction towards a point P<sub>2</sub>;  
5 determining a Delta (n) using a current reference unit pre-programmed in said  
6 processor and calculating said Delta (n), which is equal to the difference (P(n-1) -  
7 current position); and  
8 prompting said user after determining said Delta (n) to move in a direction  
9 toward the target T.

14  
1 112. A method for finding a target, comprising the steps of::  
2 transmitting a ranging signal from a searching monitor unit M<sub>S</sub>;  
3 receiving a reply ranging signal from at least three stationary slave units located  
4 on subjects or on objects at a points P<sub>1</sub>, P<sub>2</sub> and P<sub>3</sub> within a predetermined range of said  
5 searching monitor unit M<sub>S</sub>, whereby each of said points P<sub>1</sub>, P<sub>2</sub> and P<sub>3</sub> form a set of  
6 virtual coordinates relative to said point P<sub>1</sub>;  
7 determining said points P<sub>1</sub> and P<sub>2</sub> relative to said searching monitor unit M<sub>S</sub>  
8 having virtual coordinates X and Y using a processor of said searching monitor unit M<sub>S</sub>;  
9 determining a location of a mobile slave unit disposed on a subject forming a  
10 tracked target T, said target T having virtual coordinates are T<sub>y</sub> and T<sub>x</sub>;  
11 determining a location of said searching monitor unit M<sub>S</sub> relative to said tracked  
12 target T using said virtual coordinates formed by said stationary slave units and said  
13 virtual coordinates are M<sub>Sxy</sub> and S<sub>my</sub> for said searching monitor unit M<sub>S</sub>.

1 <sup>17</sup> 113. The method for finding a target of claim 112, further comprising the step of:  
2 determining a location of three stationary master units  $M_1$ ,  $M_2$  and  $M_3$ , whereby  
3 said master unit  $M_1$  is separated from said master unit  $M_2$  by a distance  $D_{12}$ , said master  
4 unit  $M_1$  is separated from said master unit  $M_3$  by a distance  $D_{13}$ , said master unit  $M_2$  is  
5 separated from said master unit  $M_3$  by a distance  $D_{23}$ .

1 <sup>18</sup> 114. The method for finding a target of claim 113, further comprising the step of:  
2 determining a distance  $Ms\_R_1$ ,  $Ms\_R_2$  and  $Ms\_R_3$  [ $SM\_R1$ ,  $SM\_R2$  and  $SM\_R3$ ]  
3 between said searching monitor unit  $M_s$  and said master units  $M_1$ ,  $M_2$  and  $M_3$  ,  
4 respectively.

1 <sup>19</sup> 115. The method for finding a target of claim 114, further comprising the step of:  
2 determining a distance  $T\_R_1$ ,  $T\_R_2$  and  $T\_R_3$  between said target  $T$  and said  
3 master units  $M_1$ ,  $M_2$  and  $M_3$ , respectively.

4 <sup>20</sup> 116. The method for finding a target of claim 115, further comprising the step of:  
5 determining position ambiguity between said master units  $M_1$ ,  $M_2$  and  $M_3$  and  
6 said distances  $D_{12}$ ,  $D_{13}$  and  $D_{23}$  so as to minimize ambiguity error between said target  $T$   
7 distances  $T\_R_1$ ,  $T\_R_2$  and  $T\_R_3$  and said master units  $M_1$ ,  $M_2$  and  $M_3$ , respectively.

8 <sup>21</sup> 117. The circuit of claim 116, wherein said data information and ranging signals  
9 determined from input signals are coupled through a band pass filter , a distance  
10 measurement unit, and said decoder.